Some New Scale Insects of Japan.

By

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With Plate IV.

Protopulvinaria japonica, sp. nov.

(Plate IV, figs. 1–4)

Adult female :—Broadly pyriform, more or less narrowed in front. Flat, five obscure ridges radiating from center to margin. Color of dried examples straw brown to light brown with a broad, well-defined, chestnut brown marginal zone. Ovisac indicated externally only by a very narrow fringe of cottony secretion. Anal cleft deep. Antennæ with eight segments ; third and eighth segments subequal in length and longer than any other segment. Formulæ of four cases of antenna :

(3, 8), 2, (4, 5), 1, 7, 6.
(3, 8), 2, 4, 5, 1, 7, 6.
3, 8, 2, 4, 5, 1, 7, 6.
8, 3, 2, (4, 5), 1, 7, 6.

Legs small ; tarsus shorter than tibia. Stigmatic spines three, in a shallow cleft ; median spine much longer than the others, stout but shorter than marginal hairs. Marginal hairs long, simple but seldom forked. Anal plates very long, their bases much longer than four times length of their outer edges ; length equal to one-eighth that of entire insect.

Length 3–4 mm., width $2\frac{1}{2}$–$3\frac{1}{2}$ mm.

Habitat :—On *Fatsia japonica* D. et P. (Yatsude) ; Nagasaki city. Collected by Y. Horikawa, September 1912.

Note :—Prof. E. E. Green, Way's end, Camberley in Surrey, to whom I have shown specimens of this species, has kindly supplied me with the following remark: "I have compared your specimens with typical examples of both *P. longivalvata* and *P. pyriformis*. Your insect appears to take a place intermediate between these two species. I note the following characters that serve to distinguish the Japanese form :—The antennæ are much longer than in either. Limbs approximately same size as *P. longivalvata* Green, but rather longer than those of *P. pyriformis* Ckll. Stigmatic spines smaller than those of *P. longivalvata*, but considerably larger than those of *P. pyriformis*. Marginal hairs very long and stout, much larger than those of either of the other two species. Anal operculum shorter than that of P. *longivalvata*, but longer than that of P. *pyriformis*."

Asterolecanium bambusicola, sp. nov.

(Plate IV, figs. 5 and 6)

Test of adult female :—Elongate, narrowed towards posterior end, strongly convex. Pale straw to pale greenish yellow in color; in the anterior half an umber-colored patch, representing the dead body of the insect. Marginal fringe of a bright pink color very conspicuous.

Length 2½–2.7 mm., width about 1 mm.

Adult female :—Elongate, narrowed behind. Dark green in color. Rostrum conspicuous, pyriform. Antennæ with three short spines. Scattered series of minute pores connecting spiracles with the margin. Anal lobes not prominent, each with a long stout seta at apex and two or more (usually three) strong spines near base. Anal ring with six stout hairs which project slightly beyond the margin. Margin with a continuous series of 8-shaped glands with inner-marginal simple pores.

Length of insect in the extended state about 2½ mm., width about 1 mm.

Habitat :—On stem and branches of bamboo, in Tokyo and other parts of Japan. Collected by the writer and others, April 1913.

Note :—With regard to this species, Prof. Green has given me the following remark : "This resembles *A. bambusæ* Bdv. superficially, but differs from that species in several important particulars. In the first place the marginal fringe is of a bright pink color. I note that the marginal series of paired glands is single on the abdomen but irregularly double on the thorax. There are numerous simple circular glands immediately within the paired series, and bands of similar pores connect the stigmata with the margin. There are no supplementary paired glands on the dorsum." The writer should state here that he has not been able to recognize the double series of paired glands on thorax, mentioned by Prof. Green.

Asterolecanium hemisphæricum, sp. nov.

(Plate IV, fig. 7)

Test of adult female :—Oval, bluntly pointed behind, very strongly convex in dorsal aspect. Color of dried examples pale straw to pale greenish yellow, with a dark brown patch in the anterior parts representing the dead body of the insect. Marginal fringe pale yellow to almost colorless.

Length $1\frac{1}{2}$–$2\frac{1}{2}$ mm., width 1.7 mm.

Adult female :—Subcircular in outline. Rostrum large, well developed; rostral loop long. Anal lobes not prominent, each bearing a long seta and two or more rather long spines near base. Anal ring with six prominent hairs which project beyond the margin. Chitinous lip of anal aperture dense and conspicuous. Marginal series of 8-shaped glands double, except close to end of abdomen, where it becomes single ; inner series of simple marginal pores well-defined and very numerous.

Length of insect in the extended state about 2 mm., width about $1\frac{1}{2}$ mm.

Habitat :—On stem and branches of bamboo, in Tokyo and other places of Japan. Collected by the writer, September 1910.

Note :—In a letter to me, Prof. Green has remarked : "This insect approaches *A. bambusæ* Bdv., but shows the following differences. The

puparium is much more strongly convex. It apparently lacks supplementary paired glands on the dorsum, but the examples that you send are not in very good condition. In all other characters it agrees with typical *bambusæ*." The writer should add here that the present species may readily be distinguished from *A. bambusæ* Bdv. by the regular double series of paired glands and by the presence of numerous simple glands.

Asterolecanium masuii, sp. nov.

(Plate IV, figs. 8 and 9)

Test of adult female :—Long and narrow, broadest in front, flattish. Dorsum with a slight median carina. Color pale straw to fresh yellow, with a dark brown patch in the anterior half representing the body of the insect. Fringe rather long, pale yellow in color.

Length about 2½–3 mm., width about 1 mm.

Adult female :—Oblong, slightly narrowed towards posterior end. Rostrum prominent, pyriform. Abdominal cleft rather deep. The lobes are not well-defined; each lobe with a stout seta and one or two spines near its base. Anal ring with six stout hairs which do not project beyond the margin. Marginal 8-shaped glands conspicuous; inner series of simple glands rather few in number.

Length of insect in the extended state about 1.3 mm., width 0.7 mm.

Habitat :—On leaves of bamboo; Tokyo and Nagasaki. Collected by the writer and others, July 1912. Named after Mr. Yoshizo Masui, who is now working on Japanese Coccidæ under the writer's direction.

Note :—Prof. Green's remark on this species in a letter to me runs : " I note that the puparium is flattish, oblong, about three times as long as it is broad, with a slight median carina. Fringe comparatively long. The marginal paired glands are conspicuous ; inner series of simple glands few. A single paired gland, of large size, on the dorsum near anterior extremity, is noticeable on one example only. The specimens have been much injured by a parasitic fungus. None of these examples agree with *A. delicatum* Green, nor are they at all nearly allied to *A. miliaris* Bdv."

Asterolecanium litseæ, sp. nov.

(Plate IV, figs. 10 and 11)

Test of adult female :—Subcircular, posterior extremity slightly produced ; dorsal surface moderately convex, with obscure carina. Very pale straw color, transparent, revealing the form of the insect and eggs beneath. Marginal fringe conspicuous, pale pinkish. In fresh examples, numerous long, glassy filaments present on dorsum.

Diameter 1.2–1½ mm.

Adult female :—Subcircular or broadly oval. Pale lemon or pale greenish yellow in color. Anal cleft not conspicuous. Anal lobe with a long seta. There exist two or three small spines at base of anal seta. Chitinous lip of anal aperture dense and conspicuous. Anal ring with six long hairs projecting beyond the margin. Inner-marginal simple pores well developed, not numerous. There occur further 8-shaped glands slightly larger than those of the margin, scattered over the dorsal area.

Diameter about 1 mm.

Habitat :—On leaves and the smaller branches of *Litsea glauca* Sieb. (Shirodamo), Matsudo in Chiba-Ken. Collected by the writer, January 1914.

Note :—This new insect resembles *A. thespesiæ* Green superficially, but is readily distinguishable from it by rather inconspicuous abdominal lobes of the female.

Asterolecanium tokyonis, sp. nov.

(Plate IV, fig. 12)

Test of adult female :—Approximately circular, abdominal extremity slightly produced. Rostrum nearly central. Parastigmatic glands extending in a narrow band to the margin. On the ventral surface of the last few segments are a number of circular simple pores. Dorsal tubular pores very numerous. Anal lobes not prominent ; each with a sharp and rather short seta with two short spines near the base. Chitinous lip of anal

aperture very prominent. Anal ring with six long hairs which extend just beyond the margin. Marginal series of 8-shaped glands double except close to end of abdomen, where it becomes single. A single series of inner-marginal simple pores very prominent. There is a series of short spines just inside of the inner-marginal simple pores.

Diameter 1–1½ mm.

Habitat :—On *Pasania cuspidata* Oerst. (Shii); Nishigahara, Tokyo. Collected by the writer, June 1912.

Note :—Allied to *A. variolosum* Ratz., but distinguishable from it by the 8-shaped glands being double instead of being single. The ventral surface of the last 3 and 4 segments provided with a number of circular pores and a few minute spine.

Nipponorthezia, gen. nov.

Adult female partly covered with cereous lamellæ; antennæ of three segments; legs with the tibio-tarsal segment united. Larva with antennæ made up of three segments.

Nipponorthezia ardisiæ, sp. nov.

(Plate IV, figs. 13–23)

Adult female :—Brown or yellowish brown; antennæ and legs yellowish brown; cereous lamellæ and marsupium snow white. Frontal lamella is short, not much projecting; lateral lamellæ are five in number; the first four lamellæ broad, flat, rounded on front edge; the fifth greatly elongated, placed along the sides of marsupium; caudal lamella arising just at anal orifice, lying low in the middle groove of marsupium. Dorsal aspect naked, segmentation plainly discernible; in the middle of each segment a pair of longitudinal, narrow, white, lamellate projections; of these the three pairs near anal extremity are large and prominent. Marsupium varying in length, its margin nearly straight, slightly narrowed towards apex; its upper side longer than the lower; longitudinally

carinated; posteriorly curved upwards, with rounded apex. Denuded female after treatment with potash, ovate, slightly narrowed in front. Gland-tracts corresponding in position to external cereous plates; glandiferous spines comparatively short and bluntly pointed; dermis between gland-tracts with spiny hairs and simple spinnerets. Antennæ spinous, three-segmented; the third segment longest, much longer than first and second segments taken together; apical spine long, pointed. Eyes prominent, not close to antennæ, tuberculate. Mentum biarticulate, slender, apical segment more than three times longer than the basal. Legs subequal, long and rather stout, strongly spinous; tibio-tarsal segment either straight or slightly curved; claw large, sharp, with a pair of slender basal spines. Anal orifice with six short spiny hairs.

Length of body 1.6 mm., width about 1.3 mm.

Length of marsupium about 1.7 mm., width about 1.3 mm.

Larva:—Ovate after treatment with potash. Antennæ of three segments, spinous, the third segment longest, with a long apical spine. Legs about the same as those of adult female.

Habitat:—On the root of *Ardisia japonica* Bl. (Yabu-kōji); Yokohama. Collected by Mr. T. Yamamura, Feb. 1914.

Note:—This new Orthezinæ is closely allied to the genus *Orthezioła*, though quite distinct from it. In this species the antennæ are constantly three-segmented and the eyes are widely separated from the basal segment of antennæ, while in *Orthezioła* the antennæ are four-segmented and the eyes are situated very close to the basal segment.

In conclusion the writer begs to thank Prof. E. E. Green for his courtesy in examining the specimens and for the assistance given him in the determination.

Explanation of Plate IV.

(All figure much enlarged)

Protopulvinaria japonica.

Figure 1. Antenna of adult female.

Figure 2. Stigmatic spines and marginal hairs of same.

Figure 3. Leg of same.

Figure 4. Anal plate of same.

Asterolecanium bambusicola.

Figure 5. Abdominal extremity of adult female.

Figure 6. Marginal fringe of test of same.

Asterolecanium hemisphæricum.

Figure 7. Abdominal extremity of adult female.

Asterolecanium masuii.

Figure 8. Abdominal extremity of adult female.

Figure 9. Marginal fringe of test of same.

Asterolecanium litseæ.

Figure 10. Abdominal extremity of adult female.

Figure 11. Marginal fringe of test of same.

Asterolecanium tokyonis.

Figure 12. Abdominal extremity of adult female.

Nipponorthezia ardisiæ.

Figure 13. Old adult female with fully developed marsupium (dorsal view).

Figure 14. Same (ventral view).

Figure 15. Adult female after treatment with potash, showing gland-tracts (dorsal view).

Figure 16. Terminal segments of same (ventral view).

Figure 17. Antenna of adult female.

Figure 18. Fore leg of same.

Figure 19. Middle leg of same.

Figure 20. Hind leg of same.

Figure 21. Mentum of same.

Figure 22. Anal orifice of same.

Figure 23. Antenna of larva.